

November 30, 2007
Blue Ribbon Task Force Delta Vision
Subject: Our Vision for California's Delta
Third draft prepared by Staff (Revised Nov. 19, 2007)

Delta Vision Committee:

First, I congratulate the Blue Ribbon Task Force on their wisdom in debates leading to a new Delta Vision. Thanks governor for truly initiating a new process for saving the delta environment along with assuring our economy and society (embraced in having open, live meetings, real-time and archival webcasts, downloadable agenda and all relevant documents, and time for government and business input as well as stakeholder and public comment). The chairman, Phillip Isenberg's, even-handed leadership is apparent in the orderly fashion in which meetings are kept on task and substantive in nature. A bit of levity is also a welcome shield against dashes of acrimony. Today is when the rubber really meets the road. Good luck on continuing to try to bring a new vision to all the parties. The staff, especially under John Kirlin's leadership, has evidently responded heroically to all requests, and their draft documents reasonably capture the essence of stated concerns and the flavor of sometimes strong feelings. I have enjoyed the ability to be 'virtually present' at each and every meeting via the webcasts which I again applaud. However, the archived video feeds should be downloadable as podcasts, all or individual agenda segments and with/without visuals. Live text-messaging of questions or comments to staff during meetings should also be possible. (I recall an alarming 20-foot tide-rise miscue that had to be corrected after one of the last meetings.) All this said, I applaud your webcasts as essential to educating the public on important statewide issues. This should become even more interactive in the future.

Thank you for the opportunity to comment on the third draft Vision statement (Nov 19, 2007, I understand this is being revised as I write and will be finalized by today). My background represents over 50 years of relevant education and experience in California's water resources. As a 4th generation Californian I know that my pioneering family has directly contributed to many of the water problems we currently face. Thus, I have a vested interest in trying to make things better for future generations. In retirement, my interest has centered on the future of California water resources. I have closely followed the development of California Water Projects since the 1960s, and the literature history of water since the gold rush days.

My expertise is marine, estuarine and fresh water ecology. I retired as Senior Scientist from Orange County Sanitation District in 1996, after first retiring in 1989 as manager of the Ocean Monitoring and Research program for the Los Angeles County Sanitation District. Previously, I managed the Salton Sea Project for DFG, followed by 3 years as Senior Ecologist of SCCWRP. Currently I provide expert advice on watershed management plans for Newport Bay. My mantra is that such ecosystems need to be studied adaptively and holistically, from 'The Pines to the Palms', to build a truly sustainable future. I believe this is also the essence of the San Francisco Bay-Delta and its watershed planning problems; we are truly all in this together. I recall a brief stint as Governor Wilson's only southern California appointee to the CalFed Science Advisory Committee in the 1990s. My opinions, which I believe were realistic and honest received less than rousing support, as if they were foreign to what was already known. But I have not seen anything to date that would cause me to rethink my positions, so I will reiterate some of them here again. (Below I have listed several published papers on the ecological basis of river-delta-estuary-bay and coastal zone connectivity, some specifically discussing the SF Bay-Delta situation.)

With minor corrections I believe the Nov. 19 draft is an excellent living document. Each of the 12 elements capture a key part of the future Delta Vision essence that can move California forward. I would like to add a few items that impinge on the question of the Delta ecosystem and future water supplies.

First, I believe that science can provide a reasonable goal for delta water distribution. For a number of reasons explored in the publications below, and documented in the early 1980s studies (2 Vols) of the Bay-Delta done by Dr. Michael A. Rozengurt at the CSUSF Tiburon Marine Laboratory, the quantitative water diversion goal should be no more than approximately 25-30% of the longterm average unregulated rivers flow. This is the maximum depletion that can be withstood by the delta environment. Meeting this goal requires a substantial reduction in current water withdrawals.

Second, I believe that the construction of a restriction channel at the mouth of San Pablo Bay would provide a useful impediment to the lurking danger of salinity intrusion into the delta proper, and this would allow somewhat more freshwater to be shunted from the delta without paying the price of moving the halocline too far upstream. This would also be of even greater import if and when the expected tidal rise due to global warming hits the bay.

Third, I believe that a series of low-head dams should be constructed above the delta to provide emergency water for future flushing flows during the lowest in-stream flow months of summer/fall.

Forth, with respect to increased supplies, I believe that following increased conservation and water efficiency, the most effective step would be to provide advanced wastewater treatment, such as is already being accomplished in Orange County on a grand scale. I have not calculated the amount of water this would provide, but I suspect it would amount to millions of acre feet statewide now just being dumped into the ocean. Formerly, the Green Acres Project in the late 1970s identified at least 500,000 thousand acre feet could be easily reclaimed in Orange and Los Angeles counties. This report sits on someones shelf!

Finally, comes the elephant in the room, an isolated external facility, once dubbed the Peripheral Canal, the remnants of which are still apparent in the burrow canal left behind in the Hwy 5 construction days. In 1982, Michael Rozengurt and I wrote a letter to then Governor Jerry Brown. In this letter we detailed our many objections to the PC, primarily being that it had not worked in Soviet water systems and that it would be unlikely to help the delta in any meaningful way. The letter is attached below. It created a lot of trouble for us both at the time, and it resulted in DWR sending Mr. Randel Brown to evaluate the Soviet construction. We were not privy to his report, but understand that it found much not to be liked.

I need to get this letter to you now if it is to be of any help in your current deliberations. So here goes. I hope that one of your staff will be able to bring this to the Delta Vision committee's attention. Again, I am so hopeful that the vision achieved will be a grand one, suitable to our grand state of California.

Sincerely yours,

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Relevant Publications:

1994. With M.A. Rozengurt. The Role of Inland Water Development in the Systemic Alteration of the Coastal Zone Environment. In: Proc. Watershed '93 National Conference on Watershed Management. Alexandria, VA. pp. 755-759.

1993. With M.A. Rozengurt. Freshwater Flow Diversion and its Implications for Coastal Zone Ecosystems. In: Transactions of the 58th North American Wildlife and Natural Resources Conference. Washington, D.C. pp. 287-295.

1991. With M.A. Rozengurt. Effects of Fresh Water Development and Water Pollution Policies on the World's River-Delta-Estuary-Coastal Zone Ecosystems." In: Ocean-91 Long Beach Proceedings; Coastal Wetlands (H.S. Bolton and O.T. Magoon, (Eds). ASCE, New York, 85-99.

1991. With M.A. Rozengurt. Effects of Fresh Water Development and Water Pollution Policies on the World's River-Delta-Estuary-Coastal Zone Ecosystems. Seventh Symposium on Coastal Zone Management (CZ '91), Long Beach, Ca. July 8-12, 1991. Pp. 85-99. In: H.S. Bolton (ed.). Coastal Wetlands. American Society of Civil Engineers, New York.

1981. With M.A. Rozengurt. Methods of Computation and Ecological Regulation of the Salinity Regime in Estuaries and Shallow Seas in Connection with Water Regulation for Human Requirements. In: Proceedings of the National Symposium on Freshwater Inflow to Estuaries, Vol. II, USFWS, Biological Services Program, FWS/OBS-81/04, Oct., p. 474-506.

1980. With M. Rozengurt. Salinity Regulation in Conjunction with Increased Water Usage of the San Francisco Bay - Delta Regime, Pacific Division, AAAS, Abstracts 61st Ann. Meeting, Davis, CA, June 1980.

Attached letter to the Governor:
Subject: The Peripheral Canal

June 20, 1980

Honorable Governor
Jerry Brown
Sacramento
California

This letter is being written to appraise you of certain facts which must be considered in your deliberations on the Peripheral canal issue currently before the California legislature and being discussed almost daily in the news. This issue has not only statewide, but national significance, as an example of large scale water development for which important ecological, economical, and social effects have already been demonstrated in similar programs of other nations.

The following facts are apparent to us, as professionals examining the demise of the San Francisco Bay Delta; some of these derive directly from observing the corpses of other similar ecosystems abroad:

1. There should be no further water projects' construction, including the Peripheral canal, until such time as new cost-benefit analyses have been done and predictions are made as to the relation between Delta outflow and (a) salt intrusion in San Francisco Bay, (b) pollution and waste treatment needs and (c) productivity of the entire system.
2. There should be no further water withdrawals from the existing Delta pool as history both here and abroad has shown severe economic and environmental damage results from greater than 30 % reductions in the natural flow.

The lack of data to understand this system and to make adequate Predictions is appalling and must be corrected immediately by a major research effort.

This must lead to a proper monitoring program to prevent future problems. The cost of these programs is estimated as at least \$2 million per year, but this is minuscule compared to the \$11 billion expenditure contemplated for replumbing the system to meet only man's perceived needs.

3. The primary question which must be answered prior to any further water development (or replumbing) is the following "What is the natural limit water withdrawals from the Sacramento River and its Delta?"

The experience of foreign countries is frightening: diversion of no more than 30 to 50 % of the normal natural runoff (computed as averaged for 55 years) has led to serious immediate consequences and subsequent, successive degradation of resources, including finally the destruction of the diverted water supply itself due to salt intrusion from an adjacent estuary and sea. Note that these results did not occur all at once, but developed slowly at first and more rapidly toward the end.

This result could be predicted at the outset, for it is quite evident now in well documented case histories. The total time span involved in the above events was measured in years, not decades or centuries, from the point of withdrawals beyond 30% of the natural, spring outflow. This leads us to predict that "25-30 % is nature's limit!" We note with alarm that withdrawals from the River-Delta currently exceed 50%, with eventual projections scheduled for 75% or more of the normal, natural flows.

We predict that the system will collapse long before this point is reached, although we would not be pleased to see this prediction come true. More to the point, we feel that there is an immediate need to protect the Delta from the already observed salinity intrusions resulting from excessive water development. Dams and the Peripheral Canal cannot correct maintaining of a positive balance of brackish and fresh water exchange necessary to sustain natural estuarine conditions, created by Nature. Other solutions exist and should be examined for their applicability to this important problem.

The Peripheral canal, by itself, cannot flush this system and cannot prevent the salt intrusion water already occurring with alarming frequency. Such a canal will destroy even more of the natural circulation and exacerbate chemical and biological deltaic environment. This is directly opposite to nature's way of enriching the system with a meandering flow and its natural reversals (due to tides and winds, not pumping activities).

A similar, to proposed one, the Peripheral Canal was built on the eastern part of Volga Delta in 1974 to restore the low river- delta tributaries. Here anadromous (beluga, sevruga, sturgeon) and semi-anadromous fish (herring, shad, others) migrate to spawn, and feed. But the Canal nearly stop these activities. And due to excessive upstream and downstream water development, the fishery had declined precipitously.

We would point out that the Delta is not a plumbing water distribution system. Historically, any delta is the heart of a rich productive river ecosystem. It receives nutrients from upstream; produces, processes and circulates its own additional nutrients within its fresh and brackish water body; and subsequently affects the rich productivity of the estuary (bay) and even the coastal sea. Any change in the course of this vital bloodstream or in the quality of its fluids will lead to change, much of which has already been shown to be detrimental to societal and economic as well as ecological systems.

My colleague and I represent almost 50 years of working experience in marine and estuarine biology, hydrology, and oceanography. This experience is directly pertinent to the problems faced today by the Delta - San Francisco Bay system. Our collective experience leads us to state that, without doubt a final result of further water developments will lead to economic, societal, and ecological ruin for the Delta - Bay for the predominant residual runoff to the San Francisco Bay corresponds to years of subnormal wetness or drought.

Published results regarding similar water development abroad (the Rivers Don and Kuban, the Volga and Terek, the Dnieper and Dniester, and the Nile and

Po, which enter the Azov, Caspian, Black, and Mediterranean Seas, respectively) all Point to the inescapable conclusion that no more than 25-30 % of the natural Flow can be diverted without disastrous consequences. The historical, average Annual Delta outflow tributary to northern San Francisco Bay was 28.5 MAF (1871-1929) and is presently about 14 MAF, a 50% reduction.

A similar runoff decline had occurred in 1923-24 and led to very serious effects even prior to major water developments.

This natural lesson should be kept in mind when discussing eventual Projections of 75% water withdrawals from the Sacramento River in 1990.

The early warning signs of this excessive withdrawal are apparent in the reduced productivity of fish and wildlife resources, increased salinity intrusion affecting municipal and agricultural water supplies, increased effects of pollution loads in progressively more stagnant waters, and both subtle and gross changes in the delta system's configuration and flow pattern.

These impacts are all the same in kind (not yet in degree) as have been thoroughly documented elsewhere. As such, equal or greater disruption to the ecology and basic economy of this system can be expected in the future. Taken together, these findings adequately demonstrate that the costs of eventual losses, where they are fully known or can be projected, far exceed any short-term benefits gained.

More importantly, it has also been demonstrated that many engineering works designed specifically to mitigate prior environmental disruption only exacerbated the problem and accelerated the eventual outcome. Detailed reports have been published over the past decade which have addressed the problems of water resources development leading to the subsequent destruction of the resource itself.

We are scientists and cannot advise you on the difficult political realities of this general problem. Nor can we understand the approach of some engineers: "first must build and answer questions later." "Final answers to many of our most perplexing questions must be derived from the construction and operation." This quote was attributed to former Director Harvey Banks in the fifties (New West Magazine, June 16, 1980). We do know that if one follows nature's example, and answers the questions the same manner that nature has, then the result will be safe for both the environment and man.

Yours very truly,

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Michael Rozengurt, Ph.D., P.E. (Oceanography, Hydrology)